CLAIMS

1. Rotary electric machine (1) comprising:

a rotor (2) with at least one permanent magnet (5), for producing an annular distribution of magnetic polarities (N, S) of angularly alternating sign about the axis of rotation (A-A) of the rotor (2), within a magnetized surface (5) lying in a plane essentially perpendicular to said axis (A-A), and

a stator (3) including:

a flow-conveying structure (16) formed as one piece with a pressure-shaped mass of insulated ferromagnetic particles; said structure (16) having an annular base portion (17) from which first and second arms (18; 19) extend substantially parallel to the axis of the rotor (A-A), said arms being situated essentially at a first and a second radial distance, respectively, from said axis (A-A) and angularly alternating with respect to each other; the ends (18a; 19a) of said first and second arms (18, 19) opposite to the base portion (17) frontally facing said magnetized surface (5a) of the rotor (5) from which they are separated by an air-gap (21); and

a winding (23) arranged coaxially with the rotor (2), in an annular region lying between said first and second arms (18; 19) of the flow-conveying structure (16).

2. Rotary electric machine according to Claim 1, in which the overall number of said first and second arms (18, 19) of the flow-conveying structure (16) is equal to the number of the magnetic polarities (N, S) produced on said surface (5a) of the rotor (5).

3. Electric machine according to Claim 1 or 2, in which said winding (23) is mounted on a bobbin (22) arranged in said annular region lying between the first and second arms (18; 19) of the flow-conveying structure (16).

4. Electric machine according to any one of the preceding claims, in which the outer arms (18) and the inner arms (19) of the flow-conveying structure (16) partially overlap in the angular direction.

5. Electric machine according to any one of the preceding claims, in which the outer and inner arms (18, 19) of the flow-conveying structure (16) have their respective end surfaces (18a, 19a) facing the permanent magnet (5) and inclined in the same sense in a circumferential direction coaxial with said magnet (5).

6. Electric machine according to any one of the preceding claims, also comprising a printed circuit board (30) housing circuits for controlling the operation of the machine (1) and fixed to lugs (25) integral with the bobbin (22) which supports the abovementioned winding (23).

7. Electric machine according to Claim 6, in which said printed circuit board (30) is arranged on the opposite side to the permanent magnet (5), relative to the flow conveying structure (16).

8. Electric machine according to Claim 7, in particular for operation as a motor, also comprising a sensor associated with the abovementioned permanent magnet (5) for providing during operation signals indicating the angular portion of the rotor (2), said sensor (34) being mounted on a support plate (3) connected to the abovementioned printed circuit board (30) and extending parallel to the axis (A-A) of the rotor (2) as far as a zone close to said magnet (5).

9. Electric machine according to any one of the preceding claims, in which the stator (3) comprises a supporting structure (7) including a tubular shaped element (9) coaxial

with the axis of rotation of the rotor (2) and in which the rotor (2) comprises a shaft (6) which extends in a projecting manner inside the said tubular shaped element (9) of the supporting structure (7) of the stator (3), being rotationally supported there by at least one bush (14; 15) or similar support device.

AMENDED CLAIMS
[received by the International Bureau on 14 February 2005 (14.02.2005); original claim 1 amended; remaining claims unchanged (1 page)]

1. Rotary electric machine (1) comprising:

a rotor (2) with at least one permanent magnet (5), for producing an annular distribution of magnetic polarities (N, S) of angularly alternating sign about the axis of rotation (A-A) of the rotor (2), within a magnetized surface (5) lying in a plane essentially perpendicular to said axis (A-A), and

a stator (3) including:

a flow-conveying structure (16) having an annular base portion (17) from which first and second arms (18; 19) extend substantially parallel to the axis of the rotor (A-A), said arms being situated essentially at a first and a second radial distance, respectively, from said axis (A-A) and angularly alternating with respect to each other; the ends (18a; 19a) of said first and second arms (18, 19) opposite to the base portion (17) frontally facing said magnetized surface (5a) of the rotor (5) from which they are separated by an air-gap (21); and

a winding (23) arranged coaxially with the rotor (2), in an annular region lying between said first and second arms (18; 19) of the flow-conveying structure (16);

characterised in that said flow-conveying structure (16) is formed as one piece with a pressure-shaped mass of insulated ferromagnetic particles, and in that the ends of said first and second arms (18, 19) thereof have terminal surfaces (18a, 19a) which are inclined all in a same direction with respect to a plane transverse to said axis (A-A).

2. Rotary electric machine according to Claim 1, in which the overall number of said first and second arms (18, 19) of the flow-conveying structure (16) is equal to the number of the magnetic polarities (N, S) produced on said surface (5a) of the rotor (5).